5TH ANNUAL **June 17-19, 2019** | Hyatt Regency Bethesda | Bethesda, MD

BIODEFENSE WORLD SUMMIT 2019

Empowering the biodefense community to recognize, assess and act on biological threats

CONFERENCE PROGRAMS

27TH INTERNATIONAL
BIODETECTION TECHNOLOGIES:
Biothreat and Pathogen Detection

27TH INTERNATIONAL
BIODETECTION TECHNOLOGIES:
Point-of-Care for Biodefense

8TH ANNUAL
BIOSURVEILLANCE INTEGRATION:
Integrated Management of Threats to Public Health & Safety

Dinner Short Course
SAMPLE PREP TECHNOLOGIES

Register by May 17 & SAVE up to $200!

KEYNOTE SPEAKERS

Cory Bernhards, PhD
Research Microbiologist, CBR, Defense Threat Reduction Agency

Stacey Broomall
Branch Chief, Biotechnology, Edgewood Chemical Biological Center, U.S. Army

Luther Lindler, PhD
Chief Scientist & Advisor, Chemical & Biological Defense, U.S. Dept of Homeland Security

Jason Paragas, PhD
Director of Innovation, Lawrence Livermore National Lab

Juergen Richt, DVM, PhD
Regents Distinguished Professor & KBA Eminant Scholar, Director, Department of Homeland Security Center of Excellence for Emerging and Zoonotic Animal Diseases, Kansas State University

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Select specific delegates from the pre-registration list to attend a private function at an upscale restaurant or a reception at the hotel. From extending invitations, to venue to suggestions, CHI will deliver your prospects and help you make the most of this invaluable experience.

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Exhibitors will enjoy facilitated networking opportunities with qualified delegates, making it the perfect platform to launch a new product, collect feedback, and generate new leads. Exhibit space sells out quickly, so reserve yours today!

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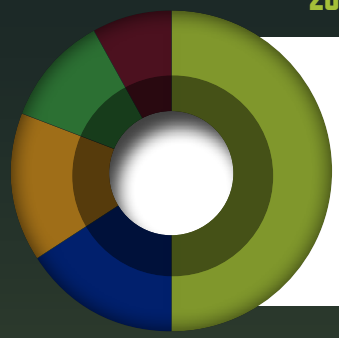
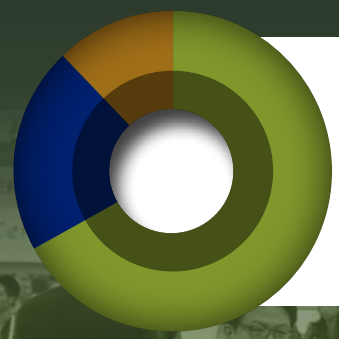
2018 CONFERENCE DEMOGRAPHICS



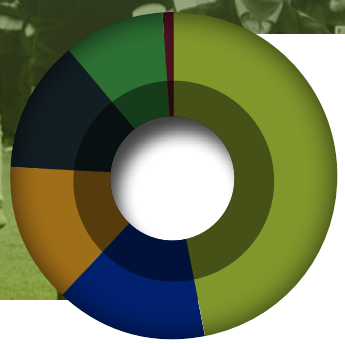
COMPANY TYPE

Biotech + Commercial	50%
Healthcare	16%
Government & Academic	15%
Other	11%
Services	8%



GEOGRAPHIC LOCATION

USA	67%
East Coast	58%
Midwest	15%
Westcoast	27%
Asia	21%
Europe	12%



DELEGATE TITLE

Executive + Director	47%
Scientist/Technologist	15%
Sales & Marketing	14%
Professor	13%
Manager	10%
Assistant	1%

DISTINGUISHED FACULTY

Ivana Haluskova Balter, PhD, Medical Advisor for R&D and Science, French Society of Immunology

Nicholas Be, PhD, Deputy Group Leader, Genomics, Lawrence Livermore National Laboratory

Cory Bernhards, PhD, Research Microbiologist, Defense Threat Reduction Agency, RDECOM Edgewood Chemical Biological Center

Roby Bhattacharyya, PhD, Assistant in Medicine, MGH Division of Infectious Diseases; Instructor, Harvard Medical School; Researcher, Broad Institute of MIT and Harvard

Stacey Broomall, Chief, BioTechnology Branch, Edgewood Chemical Biological Center, U.S. Army

Sara Del Valle, PhD, Project Leader, Los Alamos National Lab

Alina Deshpande, PhD, Group Leader, Biosecurity and Public Health, Bioscience Division, Los Alamos National Laboratory

Eric Garber, PhD, Division of Bioanalytical Chemistry, Office of Regulatory Science, Center for Food Safety and Applied Nutrition, FDA

Dylan George, Associate Director, B.Next, In-Q-Tel, Former Senior Advisor, Biological Threats Defense, Office of Science and Technology Policy, White House

Lallan Giri, PhD, CEO, Biologics Resources, LLC

Jason Harper, PhD, Senior Member of the Technical Staff, Bioenergy and Defense Technologies Department, Sandia National Laboratory

Steven Hatfill, PhD, Adjunct Assistant Professor, Division of Clinical Research and Leadership, George Washington University School of Medicine

David L. Hirschberg, PhD, Lecturer and Scientist, Department of Interdisciplinary Arts and Sciences and the Institute of Global Engagement, University of Washington, Tacoma

Chris Hoefler, PhD, Computational Biologist, Draper

Joany Jackman, PhD, Senior Scientist, Johns Hopkins University Applied Physics Laboratory

Patrick Mcnutt, PhD, Principal Investigator, US Army Medical Research Institute of Chemical Defense, USAMRICD

Luther Lindler, PhD, Chief Scientist, U.S. Department of Homeland Security

Robert Meagher, PhD, Staff Scientist, Sandia National Laboratory

Harshini Mukundan, PhD, Team Leader, Chemistry Division, Los Alamos National Laboratory

Sam Nugen, PhD, Associate Professor, Food & Biosystems Engineering, Department of Food Science, Cornell University

Jason Paragas, PhD, Director, Innovation, Lawrence Livermore National Laboratory

Timothy Reed, PhD, Microbiologist, U.S. Army

Lt. Nathanael Reynolds, Researcher, U.S. Naval Medical Research Unit, U.S. Navy

Jüergen Richt, PhD, Regents Distinguished Professor & KBA Eminent Scholar, College of Veterinary Medicine, Kansas State University

Yazmin Rivera, PhD, Molecular Biologist, USDA-APHIS

Alan Rudolph, PhD, Vice President for Research, Office of the Vice President for Research, Colorado State University

Cary A. Rue, PhD, Supervisory Microbiologist, FBI Laboratory

Christopher Russell, Managing Partner, Global Systems Engineering

Wiriya Rutvisuttinunt, PhD, Principal Investigator, Viral Diseases Branch, Walter Reed Army Institute of Research

Peter Saama, PhD, Professor, Michigan State University

Jinzhao Song, PhD, Research Associate, University of Pennsylvania

David Stiefel, National Security Policy Analyst, Office of Homeland Security, USDA

Amber Taylor, Molecular Diagnostics R&D Manager, InDevR Inc.

Chris Taitt, PhD, Research Biologist, United States Naval Research Laboratory

David Ussery, PhD, Helen Adams & the Arkansas Research Alliance Chair in Biomedical Informatics, Director, Arkansas Center for Genomic Epidemiology & Medicine, Department of Biomedical Informatics, University of Arkansas for Medical Sciences

Guy Van Den Eede, Head of Unit, Knowledge for Health and Consumer Safety, Joint Research Centre (JRC), European Commission

Willy A. Valdivia-Granda, Founder and Chief Executive Officer, Orion Integrated Biosciences Inc.

Neeraja Venkatesswaran, PhD, Senior Scientist, Tetracore

Zeev Wiesman, PhD, Professor, Biotechnology Engineering, Ben Gurion University

SC1: Sample Preparation Technologies for Pathogen Detection

Instructor:
Dave Alburty, CEO, InnovaPrep LLC

This tutorial will discuss sample preparation technologies for detection, identification and analysis of biomedical, biological and chemical agents, biothreats in point-of-care, laboratory and field settings. It will review the novel and rapid technologies for sample preparation, application of analytical strategies and automation in biodetection.

** Separate registration required for dinner short courses*

> "The Global Biodefense Summit is a gathering of the top names in the field. The best in Biodefense government research and policy as well as academic research attend and present current trends in the field at this annual meeting."

Luther L., Chief Scientist & Advisor, Chemical & Biological Defense, U.S. Department of Homeland Security

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ABOUT THE SUMMIT

Now in its 5th year, CHI's **Biodefense World Summit 2019** brings together leaders from government, academia, and industry for compelling discussions and comprehensive coverage on pathogen detection, point-of-care, biosurveillance, sample prep technologies, and bio recovery. Across three days of programming, attendees can expect exceptional networking opportunities in the exhibit hall, engaging panel discussions, and shared case studies with members of the biodefense community from technology providers to policy makers.

HOTEL & TRAVEL

Conference Venue and Hotel:
Hyatt Regency Bethesda
1 Bethesda Metro Center
Bethesda, MD 20814
Tel: 301-657-1234
Discounted Room Rate: $242 s/d
Discounted Room Rate Cut-off Date: May 17, 2019
Reservations: Go to the travel page of BiodefenseWorldSummit.com

TOP REASONS TO STAY AT THE HYATT REGENCY BETHESDA

- Complimentary internet in guest rooms
- 24 hour Gym
- No commute as conference takes place in hotel
- Hotel is located just a couple blocks from top shopping centers: Bethesda Row, Chevy Chase Pavilion and Mazza Gallerie

Please visit the travel page of **BiodefenseWorldSummit.com** for additional information.

CONFERENCE AT-A-GLANCE

	DAY ONE Monday, June 17, 2019	DAY TWO Tuesday, June 18, 2019	DAY THREE Wednesday, June 19, 2019
8:00 am - 12:00 pm	BIODETECTION TECHNOLOGIES: Biothreat and Pathogen Detection	BIOSURVEILLANCE INTEGRATION	BIODETECTION TECHNOLOGIES: Point-of-Care for Biodefense
12:00 pm - 5:00 pm	BIODETECTION TECHNOLOGIES: Biothreat and Pathogen Detection SHARED SESSION WITH BIOSURVEILLANCE INTEGRATION	BIODETECTION TECHNOLOGIES: Point-of-Care for Biodefense BIOSURVEILLANCE INTEGRATION	
6:00 pm - 8:00 pm		Dinner Short Course SAMPLE PREP TECHNOLOGIES	

MONDAY, JUNE 17

7:30 AM Registration and Morning Coffee

RAPID AND FUTURE TECHNOLOGIES FOR BIODETECTION

8:25 Chairperson's Opening Remarks
Chris Taitt, PhD, Research Biologist, United States Naval Research Laboratory

8:30 Harnessing Evolution: Designing Advanced Phage-Based Tools for Bacteria Detection
Sam Nugen, PhD, Associate Professor, Food Science, Cornell University
We can take advantage of the ability of bacteriophages, the naturally evolved predators of bacteria, to design rapid and specific tools to detect bacteria. Advances in genetic engineering and synthetic biology allow the development of synthetic phages which can infect specific hosts and deliver genetic payloads encoding custom and sensitive reporter probes. This has allowed the development of phage-based assays which can provide rapid and low-cost detection of viable bacteria.

9:00 xMAP® Multiplex Detection: Getting Beyond Detection to Include Built-In Confirmation, Characterization, and the Ability to Distinguish between Unanticipated Homologous Analytes
Eric Garber, Research Scientist, ORS, FDA CFSAN
Antibody-based assays enable the detection of analytes, though cross-reactivity with homologous analytes is a problem. Multiplex methods to generate antigenic profiles and other secondary endpoints provide built-in confirmation, recognition, and characterization, along with the detection of novel analytes. This approach was applied to the detection of toxins and then food allergens to address the complexity of a global marketplace and the prevalence of food allergies.

9:30 FEATURED PRESENTATION: The BioACER Project: Biological Automated Collector/Detector for Expeditionary Reconnaissance

Cory Bernhards, PhD, Research Microbiologist, CBR, Defense Threat Reduction Agency
Remote biothreat identification technologies are needed to reduce risk to military operators and improve decision making during a biological attack/incident. As a proof-of-concept, a prototype is currently being designed for the identification of Yersinia pestis. This future-forward technology will provide new capabilities to survey the battlefield and operational environments remotely, providing real-time data for integrated early warning.

10:00 Networking Coffee Break

10:30 A Novel Multiplex Assay for Detection of Orthopoxvirus (OPV)
Neeraja Venkateswaran, PhD, Senior Scientist, R&D, TetraCore, Inc.
Vaccinia virus (VACV) is an enveloped DNA virus belonging to genus orthopoxvirus (OPV), family Poxviridae. VACV and other closely related members, variola virus (VARV), monkeypox (MPXV) and cowpox (CPXV) may cause human febrile disease with rash which may range from being a single localized lesion to a severe fatal systemic infection such as smallpox. We have developed mouse monoclonal and rabbit polyclonal antibodies to VACV that were used to develop a novel multiplex assay for detection of OPV.

11:00 PANEL DISCUSSION: Detecting Infectious Disease Threat (IDTs) Where it is Needed
Moderator: Willy Valdivia-Granda, Founder & CEO, Orion Integrated Biosciences, Inc.
Periodically previously unknown infectious diseases emerge to affect human, animals and plants; similarly, pathogens present in a population at low levels have re-emerged rapidly in incidence and geographic range with equally grave consequences. Given the dynamics of environmental change, travel and the ability of different governments to detect IDTs is key to develop integrative policies to accurately detect infectious diseases. This panel will discuss the challenges that more 1500 IDTs pose to human, animal or plant health and how different technologies can be applied in diverse operational environments. The practical requirements, regulatory issues and policy challenges will be discussed.

12:00 PM A Rapid, Direct-from-Blood Diagnostic to Address Infections from Multidrug Resistance Organisms (MDROs)

Sponsored by T2 Biosystems

Tom Lowery, PhD, CSO, T2 Biosystems, Inc.
Increased prevalence of multidrug resistant organisms (MDRO) is recognized as a serious public health threat. Rapid, direct-from-blood diagnostic can help slow the spread of MDROs, accelerate new antibiotic clinical trials, and improve patient outcomes by rapidly identifying genes and species associated with antibiotic resistance. T2MR has enabled the first ever FDA-cleared direct-from-blood diagnostics for detection of pathogens. Here we present how clinical use of T2MR is advancing patient care and address MDRO public health threat.

12:30 Luncheon Presentation *(Sponsorship Opportunity Available)* **or Enjoy Lunch on Your Own**

SCREENING, CAPTURE & BIOSURVEILLANCE

1:55 Chairperson's Remarks
Willy Valdivia-Granda, Founder and CEO, Orion Integrated Biosciences, Inc.

2:00 KEYNOTE PRESENTATION: Perspectives on AI Disruptions for Biodefense

Jason Paragas, PhD, Director, Innovation, Lawrence Livermore National Lab
Artificial intelligence (AI) is a rapidly evolving technology that is significantly disrupting many sectors of the economy. Recently, AI-based technologies have been revealing new insights in the health and biopharmaceutical sectors. Biodefense is not immune and will be influenced by AI-based tools and the likely effects will advance our biodefense apertures. Lawrence Livermore National Laboratory has partnerships in basic science, drug discovery and development, vaccine design, and clinical medicine that serve as pathfinders in the new AI-driven science and technology landscapes.

2:30 Diagnostics in Resource-Limited Environments - An Update from Our 2018 Trials
Chris Taitt, PhD, Research Biochemist, Center for Bio Molecular Science & Engineering, U.S. Naval Research Lab
In collaboration with clinical researchers in Sierra Leone, West Africa, we have characterized a number of diagnostic platforms ranging from simple lateral flow tests to multi-step PCRs, while also determining the prevalence of several vector- and soil-borne diseases. Operation of even simple platforms in resource-limited environments can be challenging and we will describe our own experiences with test performance and information management, a critical aspect of diagnostic or clinical lab.

3:00 Opening Refreshment Break in Exhibit Hall with Poster Viewing

4:00 Mistaken Identity – The FBI Laboratory's Experience with Field Biodetection Technologies
Cary Rue, Microbiologist, Microbiology, FBI Lab

First responders need tools to help them make informed decisions concerning evacuations, medical treatments, decontaminiation and other matters. Real-world experience shows that the selection of appropriate technologies, the maturity of the technologies they are based on, and human factors are continuing to be challenges for responders. Case studies involving the use of various instruments for the detection of biological threats will be discussed.

4:30 Behind-the-Scenes of Genomic Sequencing in Surveillance and Clinical Projects

Wiriya Rutvisuttinunt, Lead Molecular Genomics Core, Viral Diseases Branch, Walter Reed Army Institute of Research

Our standard procedures for sequencing are designed to generate complete genomes from samples with large host genomic backgrounds. Herein, we will present several technical obstacles that have challenged our scientific goals and we will discuss experimental approaches used in our laboratory to overcome these problems. These results will highlight how Viral Disease Branch-WRAIR utilizes the flexibility and pushes the boundaries of NGS methods in order to generate specific data to answer complex questions in both clinical and research settings.

5:00 Metagenomic Sequencing of Air Filter Samples towards Biosurveillance in South Korea Using Nanopore Sensing Technology

Timothy Reed, Microbiologist, 20th Command CARA, US Army

In a collaboration effort with ECBC, DTRA, JPEO and the 20th Command CARA, we are developing a workflow pipeline to analyze air filter samples from Dry Filter Units (DFUs) for biothreat agents in under eight hours. This will allow orthogonal testing method for theater validation labs in South Korea and provide additional information that traditional PCR could miss or leave unclear. The use of nanopore sensing technology provides the portable, low cost and rapid library preparation needed to provide metagenomic sequencing capabilities in South Korea.

5:30 Welcome Reception in the Exhibit Hall with Poster Viewing

6:30 End of Day

TUESDAY, JUNE 18

8:30 AM Morning Coffee

IDENTIFICATION & MANAGEMENT OF EMERGING AND REEMERGING PATHOGENS

8:55 Chairperson's Remarks

Cory Bernhards, PhD, Research Microbiologist, Defense Threat Reduction Agency, RDECOM Edgewood Chemical Biological Center

9:00 Challenges and Opportunities in Agricultural Biodetection Deployment and Adoption

Alan Rudolph, Vice President for Research, Colorado State University

The agricultural industry has experienced significant losses and economic consequences, estimated in the billions of dollars, from infectious disease outbreaks in animals and plants caused by pathogens. This session will provide an overview of the state of the challenges associated with agricultural threat and pathogen detection; new policies and investments in the United States for agricultural biosecurity; and a discussion of the challenges and opportunities of deployment and adoption of new biodetection technologies within communities of use, including the socio-cultural barriers in the introduction and adoption of new biodetection technologies and practices.

9:30 Genomic Characterization of Known and Unknown Organisms in Terrestrial and Aquatic Environments

Willy Valdivia-Granda, Founder & CEO, Orion Integrated Biosciences, Inc.

In this talk we will present a new approach for the sensitive detection and characterization of known and unknown organisms using second and third generation DNA sequencing technologies. Our approach will discuss the characterization with resolution at strain level and the implications in the assessment of threat level using plasmid information, virulence factors and antimicrobial resistance profiles. The accuracy of different sequencing platforms and benchmarking of available analysis tools against RIGEL-MTP will be highlighted.

Sponsored by Oxford NANOPORE technologies

10:00 Mobile Sequencing to Enable…

James Brayer, Associate Director of Marketing Development, Oxford Nanopore Technologies Ltd.

Oxford Nanopore Technologies (ONT) has developed a disruptive mobile platform that is enabling researchers to generate NGS data for novel applications where portability, simplicity and real time data acquisition are critical. Learn about recent advancements to our platform where increased accuracy and output will further expand the applications that our devices will enable. ONT has developed new chemistry and library prep kits that will improve our raw accuracy and simplicity to go from biological samples to sequence ready molecules.

10:30 Coffee Break in the Exhibit Hall with Poster Viewing

11:15 Adapting New Technologies for the Molecular Diagnostics of High Consequence and Regulatory Plant Pathogens

Yazmin Rivera, Molecular Biologist, PPQ S&T, US Department of Agriculture APHIS

The USDA APHIS PPQ Center for Plant Health Science and Technology focuses on using the latest technology for the molecular detection and diagnostics of plant pathogens of high consequence for the United States. Over the years, technologies like CANARY, isothermal amplification, and high throughput sequencing have been used to support decisions that safeguard United States agriculture and trade. This presentation will discuss the successes and challenges in the diagnosis of plant pathogens, and current efforts using the latest technologies.

ADVANCES IN NUCLEIC ACID TECHNOLOGIES & NEXT-GENERATION SEQUENCING

11:45 U.S. Navy Efforts in Field-Forward DNA Sequencing

Nathanael Reynolds, CBMSE, US Naval Research Lab

Recent natural infectious diseases outbreaks and proliferation of dual-use bio-technologies have elevated the risk of biological threats to the military and global heath. To enhance the U.S. Navy's ability to detect and identify infectious disease agents within a mobile setting, the U.S. Naval Research Laboratory (NRL) in collaboration with the Biological Defense Research Directorate (BDRD) is developing a field-forward DNA sequencing capability. Utilizing the Oxford Nanopore Technology's MinION sequencer, we have demonstrated bacterial bio-agent identification within a field-forward mobile laboratory setting through amplicon-based sequencing. Efforts are underway to demonstrate expanded DNA amplicon and metagenomic sequencing capabilities for comprehensive biothreat identification in a deployed mobile laboratory and shipboard environment.

12:15 PM End of Biodetection Technologies: Biothreat and Pathogen Detection

MONDAY, JUNE 17

SCREENING, CAPTURE & BIOSURVEILLANCE

1:55 PM Chairperson's Remarks
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Chris Taitt, PhD, Research Biochemist, Center for Bio Molecular Science & Engineering, US Naval Research Lab

3:00 Opening Refreshment Break in Exhibit Hall with Poster Viewing

4:00 Mistaken Identity – Critique of Field Biodetection Technologies and Their Use Incidents
Cary Rue, Microbiologist, Microbiology Department, FBI Laboratory
This presentation will focus on a critique of field biodetection technologies and their use incidents that the FBI laboratory has been involved in.

4:30 Behind-the-Scenes of Genomic Sequencing in Surveillance and Clinical Projects
Wiriya Rutvisuttinunt, Lead Molecular Genomics Core, Viral Diseases Branch, Walter Reed Army Institute of Research
Our standard procedures for sequencing are designed to generate complete genomes from samples with large host genomic backgrounds. Herein, we will present several technical obstacles that have challenged our scientific goals and we will discuss experimental approaches used in our laboratory to overcome these problems. These results will highlight how Viral Disease Branch-WRAIR utilizes the flexibility and pushes the boundaries of NGS methods in order to generate specific data to answer complex questions in both clinical and research settings.

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5:30 Welcome Reception in the Exhibit Hall with Poster Viewing

6:30 End of Day

TUESDAY, JUNE 18

8:30 AM Morning Coffee

RISK ANTICIPATION

8:55 Chairperson's Remarks
David Ussery, PhD, Helen Adams & The Arkansas Research Alliance Chair in Biomedical Informatics, Director, Arkansas Center for Genomic Epidemiology & Medicine, Department of Biomedical Informatics, University of Arkansas for Medical Sciences

9:00 KEYNOTE PRESENTATION: Biodefense to Support the Homeland Security Enterprise

Luther Lindler, PhD, Chief Scientist & Advisor, Chemical & Biological Defense, U.S. Department of Homeland Security
The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) performs research and development for DHS. Current threat awareness projects being executed by DHS include characterization of high consequence pathogens through funded laboratory studies. DHS has contributed to the response and recovery area by performing clean up and modeling testing for underground transportation. These programs will be discussed in the presentation to introduce the audience to the critical mission DHS performs within the area of biodefense.

9:30 KEYNOTE PRESENTATION: The $7 Billion Dollar Team: Making Biotechnology Better, Stronger, Faster

Stacey Broomall, Branch Chief, Biotechnology, Edgewood Chemical Biological Center, U.S. Army
Whether sustaining an award-winning cryorepository; providing standardization and quality management services; leveraging extensive detection assay development and testing expertise; or expanding large-scale fermentation suite capabilities to marry material sciences and biological engineering into pioneering new technologies, Edgewood Chemical and Biological Center has a long history of delivering both technological innovation and pathogen detection resources and materials to the soldiers of tomorrow and beyond.

10:00 Sponsored Presentation *(Opportunity Available)*

10:30 Coffee Break in the Exhibit Hall with Poster Viewing

11:15 Roles that the Environment and Natural Resources Play on Security, Tactics, Behavior, and Terrorism and USDA's Response
David Stiefel, National Security Policy Analyst, Office of Homeland Security, USDA
Climate change and environmental stressors push populations and actors in a variety of ways. Pathogens can migrate across borders and through trade. USDA is playing a major role in the drafting and implementation of the National Biodefense Strategy. USDA, in partnership with the Department of Homeland Security, has also begun the construction of the National Bio and Agro-defense Facility, or NBAF; which will be America's foremost animal disease research facility.

ADVANCES IN NUCLEIC ACID TECHNOLOGIES & NEXT GENERATION SEQUENCING

11:45 Immunology & Surveillance and Preparedness Plans
Ivana Haluskova-Balter, Medical Advisor, R&D & Science, French Society of Immunology

12:15 PM Enjoy Lunch on Your Own

12:30 Registration

THREAT IDENTIFICATION & CHARACTERIZATION

1:25 Chairperson's Remarks

Luther Lindler, PhD, Chief Scientist & Advisor, Chemical & Biological Defense, U.S. Department of Homeland Security

1:30 Analytics for Investigation of Disease Outbreaks (AIDO) – A Web-Based Analytic Facilitating Situational Awareness in Unfolding Disease Outbreaks

Alina Deshpande, Biomedical Scientist, Defense Systems & Analysis, Los Alamos National Laboratory

Information from historical infectious disease outbreaks provides real-world data about outbreaks and its impacts on affected populations. These data can be used to develop a picture of an unfolding outbreak in its early stages when incoming information is sparse and isolated in order to identify effective control measures and guide their implementation. We will present a new approach to applying historical outbreak data to provide actionable information during the early stages of an unfolding infectious disease outbreak.

2:00 Real-Time, Full Length Genome Sequencing of DNA and RNA Viruses

David Ussery, PhD, Helen Adams & The Arkansas Research Alliance Chair in Biomedical Informatics, Director, Arkansas Center for Genomic Epidemiology & Medicine, Department of Biomedical Informatics, University of Arkansas for Medical Sciences

Third generation, single-molecule sequencing allows for long reads, and with the right chemistry the possibility of directly sequencing RNA molecules. We have sequenced a mixture of six different DNA and RNA viruses, and have obtained full length viral genome reads for all six. Further, it is possible to detect modified bases in both genomic DNA as well as RNA from the sequencing data, making possible epigenetic and epi-transcriptomic analysis of viral genomes.

2:30 Development of Portable and Wearable Platforms to Detect Threats and Measure Human Performance in Resource Limited Environments

David Hirschberg, Professor & Scientist, Interdisciplinary Arts & Sciences, University of Washington Tacoma

3:00 Characterization of Microbial Communities and Pathogens for The Public Health and National Defense Community

Nicolas Be, PhD, Deputy Group Leader, Genomics, Lawrence Livermore National Laboratory

3:30 Refreshment Break with Exhibit Hall with Poster Viewing

ABERRATION DETECTION

4:15 Real-Time Heterogeneous Data Fusion Approaches to Predict Dengue

Sara Del Valle Pena, Scientist & Team Leader, Los Alamos National Laboratory

There is an urgent need for improved prediction of their spread so that mitigation techniques and treatments can be administered proactively rather than just reactively. Remote sensing imagery is an attractive data source to exploit for this application as it provides real-time information without having to physically be on the ground. Here, we derive standard indices from multispectral imagery and explore how predictive they are for forecasting dengue incidence in Brazil.

INFORMATION INTEGRATION, ANALYSIS & SHARING

4:35 Federal Response and Recovery to CBR Events - The Defined Need for Time and Space to Make Decisions

Christopher Russell, Managing Partner, Global Systems Engineering

The Biological Threat Reduction Program has a focus of enabling international partners to detect, characterize and respond to naturally-occurring or man-made events earlier—provides global decision makers with increased time and space to mitigate potential pandemics. Through this talk, we will explore the needs of decision-makers and the nexus between technology and operations.

4:55 Tackling the Next Epidemic: Data Technology to the Rescue

Dylan George, PhD, Associate Director BNext, BNext, In Q Tel, Inc.

Integrating novel and available data technologies into public health practice will improve situational awareness, help shape outbreak interventions more precisely, facilitate faster and more efficient response activities and save lives. To realize these efficiencies, federal, state and local public health agencies need a fundamentally more aggressive and systematic adoption, use and coordination of data technologies to provide essential information for tailoring interventions during an outbreak.

5:15 End of Biosurveillance Integration & Dinner Short Course Registration*

6:00 SC1: Sample Preparation Technologies for Pathogen Detection

~~SC2: Commercializing the Next Generation of Biodefense Tools and Technology~~

**See page 4 for details, separate registration required.*

TUESDAY, JUNE 18

12:30 PM Registration

OPTIMIZING PERFORMANCE OF TRADITIONAL POINT-OF-CARE DETECTION

1:25 PM Chairperson's Remarks
Harshi Mukundan, PhD, Team Leader, Chemistry Division, Los Alamos National Laboratory

1:30 An Affordable System for a Rapid Mass Casualty Response to a Large Area Coverage Biological Incident
Steven Hatfill, Adjunct Asstistant Professor, Microbiology & Immunology & Tropical Medicine, George Washington University
Based on the proven concept of the hospital trains used for mass casualty management during the first two World Wars, the concept for an all hazards "disaster train" is outlined to illustrate a new approach to consequence management of a large-scale biological incident.

2:00 Facilitating the Path to Commercialization via Resources Provided by Centers for Point-of-Care Technology
Joany Jackman, PhD, Senior Scientist, Johns Hopkins Applied Physics Laboratory
Starting in 2007, the National Institute of Biomedical Imaging and Bioengineering (NIBIB), established a network of centers to enhance the progression of promising technologies to the commercial market. The Johns Hopkins Center for Point of Care Tests for Sexually Transmitted Diseases is one of those centers. It provides resources to industry and organizations at no charge to speed the progression of promising technologies to commercialization. These resources include technology comparisons, access to physicians and other end users, de-identified clinical samples, implementation guidance, critical path funding and other resources to help companies reach the market faster.

2:30 How to Support Biodefense Policies with Solid Evidence-Based Fact? Lessons Learned from EU Policies that Required Solid Evidence-Based Facts
Guy Van den Eede, Head of Unit, Knowledge for Health & Consumer Safety, European Commission
Any policy intervention/action/decision ought to be based on solid, evidence-based scientific facts that have been analysed with adequately validated reference methodologies. The presentation will provide examples on how this challenge is approached in EU on other health-related EU policies, as a baseline of knowledge that might inspire the challenge on how to efficiently and globally coordinate efforts for biothreat and pathogen detection in support to biodefence policies.

3:00 Hospital Acquired Infections as a Threat to Public Health and Global Security
Peter Saama, Adjunct Professor, Probability & Statistics, Michigan State University
The deliberate exploitation of naturally occurring infectious micro-organisms and release into vulnerable sub-populations constitutes a global catastrophic biological risk. Of specific concern is the intentional release of such organisms in a manner that would elicit a burden of disease above and beyond the capabilities of available medical countermeasures. Consequences include increased morbidity, mortality, anxiety, societal instability, economic burden, and disruption of global security. Pediatric, geriatric and immune-compromised patients are at a higher risk for hospital acquired infections (HAIs). We present and discuss risk factors for acute care neonatal, pediatric, and geriatric HAIs. This information is crucial for determining resource needs for biothreat detection and mitigating risk which, in turn, strengthen preparedness.

3:30 Refreshment Break with Exhibit Hall with Poster Viewing

ADVANCES IN THERAPEUTICS AT THE POINT-OF-CARE

4:15 KEYNOTE PRESENTATION: Mass Applicable Vaccines against Highly Pathogenic Influenza Viruses

Juergen Richt, DVM, PhD, Regents Distinguished Professor & KBA Eminant Scholar, Director, Department of Homeland Security Center of Excellence for Emerging and Zoonotic Animal Diseases, Kansas State University
Vaccination is one of the most effective ways to control influenza outbreaks and protect animal and public health. Newcastle disease virus (NDV)-based influenza vaccines have been demonstrated to be efficacious and safe in poultry. Herein, we developed an NDV-based H5 vaccine (NDV-H5) that expresses a codon-optimized ectodomain of the hemagglutinin from an H5N2 virus and evaluated its efficacy in chickens. Results showed that both live and inactivated NDV-H5 vaccines completely protected chickens from lethal challenge with a highly pathogenic H5N2 virus.

4:45 Anthrax Vaccine that Requires Only 3 Doses Compared to 6 Doses of Currently Licensed Anthrax Vaccine
Lallan Giri, PhD, CEO, Biologics Resources LLC
Our newly developed anthrax vaccine has proven efficacious with only three doses of vaccine required for adults and children based on pre-clinical studies with approximately 3 doses over three months as compared to currently licensed anthrax vaccine which requires 6 doses over 6 months.

5:15 End of Day & Dinner Short Course Registration*

6:00 SC1: Sample Preparation Technologies for Pathogen Detection

~~**SC2: Commercializing the Next Generation of Biodefense Tools and Technology**~~
**See page 4 for details, separate registration required.*

WEDNESDAY, JUNE 19

8:30 AM Morning Coffee

TOOLS AND TECHNOLOGY AT THE POINT-OF-CARE

8:55 Chairperson's Remarks
Joany Jackman, PhD, Senior Scientist, Johns Hopkins Applied Physics Laboratory

9:00 A Single Diagnostic for Triage of Bacterial Infection - The Universal Bacterial Sensor
Harshini Mukundan, Principal Investigator & Team Leader, Chemistry for Biomedical Applications, Los Alamos National Laboratory
Extending the concepts of innate immune recognition to the laboratory can allow for universal diagnostics. We have been working on this premise for a decade, facing three major challenges - 1) detection on amphiphiles signatures, 2) sensitive diagnostic platforms, and 3) engineering portable and automated systems. This presentation will cover a description of the development so far and clinical data demonstrating our sensor and approach.

9:30 A Smart Phone Platform for Detection of Zika Virus RNA in Low Resource Settings

Robert Meagher, Staff Scientist, Biotechnology & Bioengineering, Sandia National Labs

We present here a series of advances in portable nucleic acid amplification testing by interfacing our QUASR RT-LAMP assay detection with a consumer class smart phone that both controls simple assay hardware, and performs assay analysis and scoring. The resulting system breaks conventional barriers of differential diagnostics by directly detecting multiple viral targets from crude human samples, including Zika, chikungunya, and dengue viruses, and providing proof of concept for a new generation of fast, affordable, and portable diagnostic tools.

10:00 Networking Coffee Break

10:30 An RNA Detection Platform for Rapid Bacterial Identification and Combined Genotypic and Phenotypic Antibiotic Susceptibility Testing

Roby Bhattacharyya, PhD, Assistant in Medicine, MGH Division of Infectious Diseases; Instructor, Harvard Medical School; Researcher, Broad Institute of MIT and Harvard

In this talk we demonstrate that a multiplexed, hybridization-based RNA detection platform, NanoString, can be used for accurate and sensitive broad-range bacterial detection from crude lysates and primary clinical samples through rRNA detection, with identification of known and phylogenetic classification of unknown organisms. We also show that transcriptional signatures of antibiotic response can be used for phenotypic antibiotic susceptibility testing (AST) on the same RNA detection platform, with simultaneous measurement of key genetic resistance determinants in the same assay.

10:50 Point-of-Care Radiation Biodosimeter for Triage Following a Nuclear Event

Kathryn Todd, PhD, Associate Laboratory Director, SRI International

The Biomedical Advanced Research and Development Authority (BARDA) has funded SRI International (SRI) under Contract HHSO100201700030C to develop a point-of-care (POC) radiation biodosimeter for use as a triage medical device in the case of a nuclear event in an urban setting, where approximately 1M individuals may be exposed to ionizing radiation. This presentation will discuss the system concept, development, and validation strategy of SRI's POC radiation biodosimeter. We will also address the unique challenges of pursuing regulatory clearance for a POC triage radiation biodosimeter.

11:10 Smart Chemical-Morphological NMR Relaxometry Facile Sensor for Food Security and Quality

Zeev Weismann, PhD, Professor, Biotechnology Engineering, Ben Gurion University

Our new smart chemical-morphological NMR relaxometry sensor is a portable and facile tool ready to use at the point of use by decision makers in the field of food security and quality. This sensor provides valuable information based on chemical composition and morphological structure extracted from NMR relaxation signal data. It provides the ability to carry out rapid material characterization of solid and liquid complex organic natural and processed materials, including identification of bacterial and fungal Biofilms.

11:30 Sponsored Presentation *(Opportunity Available)*

12:00 PM Enjoy Lunch on Your Own

ADVANCES IN FIELDABLE TECHNOLOGIES AND ASSAYS

1:40 Chairperson's Remarks

Steven Hatfill, PhD, Adjunct Assistant Professor, Division of Clinical Research and Leadership, George Washington University School of Medicine

1:45 Same Day, Single Assay Identification of Seasonal and Emerging Influenza Viruses with FluChip-8G Insight

Amber Taylor, R&D Manager, Molecular Diagnostics, InDevR Inc.

FluChip-8G Insight is a microarray-based molecular assay that provides same day subtyping of seasonal and nonseasonal influenza A viruses and lineage differentiation of influenza B viruses in a single, multiplexed assay with automated data interpretation. The FluChip-8G Insight assay is a powerful tool for influenza surveillance that provides same day identification of potentially pandemic influenza A while also providing detection and differentiation of seasonally circulating influenza viruses.

2:15 Physiological Models of the Most Potent Poison: Acute and Chronic Animal Models of Respiratory Botulism

Patrick McNutt, Principal Investigator, U.S. Army Medical Research Institute of Chemical Defense, USAMRICD

Botulinum neurotoxins (BoNTs) are a family of neuroparalytic proteins expressed by members of the Clostridium genus of anaerobic bacteria. Collectively, the BoNTs are the most poisonous substances known. Here we present new animal models to study the progression and reversal of respiratory botulism with high resolution and use these models to demonstrate treatment strategies that effectively restore respiratory function in animals exposed to sublethal and lethal doses of botulism.

2:45 Networking Refreshment Break

3:00 A "Universal" Bio-Sample Stabilization & Preservation Medium: Simple, Low-Cost Environmental Sample Collection and Storage

Jason Harper, Senior Technical Staff Member, Bioenergy & Biodefense Technologies, Sandia National Labs

We have discovered and continue to explore silica-based hybrid materials that have been successfully used for biomolecule and living cell stabilization. This sample stabilization medium addresses significant challenges faced by far-forward military personal. Rapid in-field detectors can provide preliminary analysis of biosamples, but subsequent testing for validation or forensic analysis may be necessary. Safe and secure collection and stabilization of biological samples would allow for accurate biosample identification, ensuring proper treatments are received. Further, allowing transport of biosamples from resource-limited regions to a modern bioanalytical laboratory would prove invaluable in identification of emerging/unknown biothreats.

3:30 Bacterial Detection and Antimicrobial Resistance Testing Using Luminescent Bacteriophages: Clinical and Biodefense Applications

Jason Holder, PhD, Principal Member, Technical Staff, Draper

Draper has developed a diagnostic platform technology for rapid bacterial Identification and Antibiotic Susceptibility Testing (IDAST) utilizing engineered bacteriophage probes that produce light upon successful infection of a bacterial host. To date, this "lumiphage" technology has targeted clinical applications, where rapid (<2 hours) identification of infecting agents and their antibiotic susceptibility profiles is urgently needed to combat the growing antimicrobial resistance (AMR) problem. Approaches to bacterial diagnostic testing using bacteriophages will be discussed as well as a potential application for airborne bacterial threat detection.

4:00 Smartphone-Based Mobile Detection Platform for Rapid and Quantitative Molecular Diagnostics

Jinzhao Song, PhD, Research Assoc, Mechanical Engineering & Applied Mechanics, University of Pennsylvania

Rapid and quantitative molecular diagnostics in the field, at home, and at remote clinics is essential for evidence-based disease management, control, and prevention. Conventional molecular diagnostics requires extensive sample preparation, relatively sophisticated instruments, and trained personnel, restricting its use to centralized laboratories. To overcome these limitations, we designed a simple, inexpensive, hand-held, smartphone-based mobile detection platform "smart-connected cup", for rapid, connected, and quantitative molecular diagnostics.

4:30 Close of Summit

BIODEFENSE WORLD SUMMIT 2019

Pricing and Registration Information

CONFERENCE PRICING

PREMIUM PACKAGE - Best Value! (Includes access to 2 conferences, excludes short courses)	Commercial	Academic, Government, Hospital-affiliated
Advance - Registration Rate Until May 17, 2019	$1799	$1099
Registrations After May 17, 2019 and On-Site	$1999	$1299
STANDARD PACKAGE (Includes access to 1 conference, excludes short courses)		
Advance - Registration Rate Until May 17, 2019	$1199	$899
Registrations After May 17, 2019 and On-Site	$1299	$999

Monday - Tuesday June 17-18	Tuedsay - Wednesday June 18-19
C1: Biodetection Technologies: Biothreat & Pathogen Detection	C2: Biodetection Technologies: Point-of-Care for Biodefense
C3: Biosurveillance Integration	

SHORT COURSES

One short course	$549	$349

Tuesday, June 18, 2019 | 6:00 - 8:00 PM (Dinner Provided)
SC1: Sample Preparation Technologies for Pathogen Detection
~~SC2: Commercializing the Next Generation of Biodefense Tools and Technology~~

CONFERENCE DISCOUNTS

Poster Submission - **Discount ($50 Off)**: Poster abstracts are due by May 10, 2019. Once your registration has been fully processed, we will send an email containing a unique link allowing you to submit your poster abstract. If you do not receive your link within 5 business days, please contact jring@healthtech.com. *CHI reserves the right to publish your poster title and abstract in various marketing materials and products.

REGISTER 3 - 4th IS FREE: Individuals must register for the same conference or conference combination and submit completed registration form together for discount to apply.

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If you are unable to attend but would like to purchase the Biodefense World Summit CD for $750 (plus shipping), please visit BiodefenseWorldSummit.com. Massachusetts delivery will include sales tax.

ADDITIONAL REGISTRATION DETAILS

Each registration includes all conference sessions, posters and exhibits, food functions, and access to the conference proceedings link.

Handicapped Equal Access: In accordance with the ADA, Cambridge Healthtech Institute is pleased to arrange special accommodations for attendees with special needs. All requests for such assistance must be submitted in writing to CHI at least 30 days prior to the start of the meeting.

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How to Register: BiodefenseWorldSummit.com

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Please use keycode **1940F** when registering!

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